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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,851	03/31/2004	Michael F. Cohen	MSI-1895US	561.I
22801	7590	05/07/2007		
LEE & HAYES PLLC 421 W RIVERSIDE AVENUE SUITE 500 SPOKANE, WA 99201			EXAMINER BITAR, NANCY	
			ART UNIT 2624	PAPER NUMBER
			NOTIFICATION DATE 05/07/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

lhptoms@leehayes.com

Office Action Summary	Application No. 10/814,851	Applicant(s) COHEN ET AL.	
	Examiner Nancy Bitar	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 20-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-19, drawn to "performing a spatio-temporal segmentation analysis on the video", classified in class 382, subclass 173.
 - II. Claims 20-25, drawn to "determining a set of volumetric objects by means shift video segmentation with respect to keyframes interpolation", classified in class 348, subclass 36.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination II has separate utility such as determining a stroke sheet that is lying within the semantic region in order to provides a very powerful system for the stylization of video. See MPEP § 806.05(d).

The examiner has required restriction between subcombinations usable together. Where applicant elects a subcombination and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a).

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Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

3. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper and there would be a serious burden on the examiner if restriction is not required because the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Mr. Rustan Hill on 04/24/2007 a provisional election was made without traverse to prosecute the invention of "stylization of video by performing spatio-temporal segmentation analysis", claims 1-19. Affirmation of this election must be made by applicant in replying to this Office action. Claims 20-25 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Examiner Notes

5. Examiner cites particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied

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to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable by Mittal et al (US 2005/0286764) in view of DeMenthon et al (Spatio-Temporal Segmentation of Video by Hierarchical Mean Shift Analysis, July 2002)

As to claim 1, Mittal teaches a method for stylizing video, comprising: performing a spatio-temporal segmentation analysis on the video to identify three dimensional volumes (optical flow computation, spatio-temporal domain, paragraph [0012]) of contiguous pixels having a similar characteristic; receiving an input identifying a group of the three dimensional volumes; and identifying the group of three dimensional volumes as a single semantic region (forming a background model in a high-dimensional space, paragraph [0019]). Note that the optical flow constraint equation is applied at a given point defined by a spatial

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location and time to obtain respective constraints; applying an error function to combine the respective constraints from each the given point within a defined region for deriving a characteristic function; deriving a motion estimate from the characteristic function; and comparing the motion estimate with a given uncertainty model so as to derive a figure of uncertainty for optical flow measurement data, paragraph [0022], paragraph [0078]).

While Mittal et al meets a number of the limitations of the claimed invention, as pointed out more fully above, Mittal fails to specifically teach the spatio-temporal segmentation by mean shift analysis. Specifically, DeMenthon et al. teaches the use of spatio temporal segmentation of video sequences by adopting a hierarchical clustering method, which operates by repeatedly applying mean shift analysis over increasingly high ranges. Because the segmentation analysis of DeMenthon includes color segmentation and motion segmentation, as well as consistent labeling of regions over time which amounts to region tracking. It would have been obvious to one of ordinary skill in the art to use the spatio-temporal segmentation analysis in Mittal in order to provide a hierarchical segmentation of data thus obtaining cleaner boundaries and help in video indexing and retrieval. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claim 2, Mittal teaches the method of claim 1, wherein the similar characteristic comprises color (figure 9, color representation, note that the

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dynamic scene comprises utilizing optical flow information to discriminate between observations exhibiting similar color components)

As to claim 3, Mittal teaches the method of claim 1, wherein the spatio-temporal segmentation analysis comprises an anisotropic kernel mean shift segmentation procedure (anisotropic non-linear filters can be considered, paragraph [0129])

As to claim 4, Mittal teaches the method of claim 1, wherein the input comprises an interactive user input (the user determines the degree of sensitivity, paragraph [0188]).

As to claim 5, Mittal teaches the method of claim 1, wherein the three dimensional volumes of contiguous pixels comprise segments (apparatus for dividing the image into blocks, paragraph [0026]).

As to claim 6, Mittal teaches the method of claim 5, wherein the user input comprises outlining a plurality of segments (apparatus for dividing the image into blocks, paragraph [0026]).

As to claim 7, teaches the method of claim 6, wherein the outlining (morphological operation) is performed on a number of keyframes of the video, the number of keyframes being fewer than a total number of frames of the video (note that the image is divided into blocks, and for each block, PCA is performed using a certain number of previous frames, paragraph [0026-0028], figure 1)

As to claim 8, teaches the method of claim 7, wherein additional segments on frames of the video other than keyframes are identified by determining a

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relationship of the additional segments to the segments outlined on the keyframes, (figures 9-11; paragraph [0079].

As to claim 9 and 10, Mittal teaches relationship comprises at least a portion of the additional segments being enclosed by one or more of the segments outlined on the keyframes and at least a portion comprises at least a majority of pixels of the additional segments (The method is able to capture the long term dynamic characteristics of the scene, temporal and structural relationships between different pixels and multiple modalities of dynamic behavior, paragraph [0109], [0110]).

As to claim 11, teaches the method of claim 1, further comprising applying a stylization to the single semantic region (note that a simple model keeps a single background image, paragraph [0046]).

As to claim 12, Mittal teaches the method of claim 11, wherein the stylization comprises a mean shift technique (The Variable Bandwidth Mean shift and Data-Driven Scale Selection, paragraph [0082])

Claims 13-19 differ from claims 1-12 only in that claims 13-19 are computer claim whereas, claims 1-12 are methods claim. Thus, claims 13- 19 are analyzed as previously discussed with respect to claims 1-12 above.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Ziao et al (US 2007/0092122) Is cited to teach estimation of optical flow by performing color segmentation and adaptive bilateral filtering to regularize the flow field to achieve a more accurate flow field estimation. After creating pyramid models for two input image frames, color segmentation is performed. Next, starting from a top level of the pyramid, additive flow vectors are iteratively estimated between the reference frames by a process including occlusion detection, wherein the symmetric property of backward and forward flow is enforced for the non-occluded regions. Next, a final estimated optical flow field is generated by expanding the current pyramid level to the next lower level and the repeating the process until the lowest level is reached. This approach not only generates efficient spatial-coherent flow fields, but also accurately locates flow discontinuities along the motion boundaries.

Cham et al (US 6,795,567) is cited to teach tracking an object model in a sequence of frames where the object model comprises a plurality of features and is described by a model state, includes both selecting an unregistered feature of the object model and selecting an available frame from the sequence of frames, to minimize a cost function of a subsequent search. A search is performed for a match of the selected model feature to the image in the selected frame in order to register the feature in that frame. The model state is then updated for each available frame. The steps of selecting, searching and updating are repeated.

Inquiries

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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nancy Bitar whose telephone number is 571-270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on 571-272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nancy Bitar



JOSEPH MANCUSO
SUPERVISORY PATENT EXAMINER

04/23/2007